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(54) **Method for producing flat coverings**

(57) A method for producing flat coverings comprising the steps of: laying, on a previously prepared foundation (2), a first and a second layers (3,5) composed of a cement mix having elastoplastic characteristics,

between which a microscopically perforated membrane (14) having low water-permeability and good water-vapor permeability characteristics is laid.

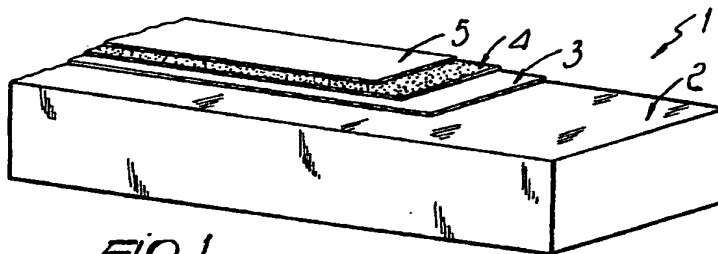


Fig. 1

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Description

Repair of flat coverings is mostly performed by demolishing the upper part of the covering (tiles, cement support, sealing membranes, layers of thermally insulating materials, etcetera) and repairing with new material, usually similar to the existing one.

This entails setting up an actual building yard, with all the problems linked to the movement of considerable amounts of materials, both for waste removal and for supplying the material required for repair.

Repair methods are also currently known which add, on an appropriately prepared foundation, impermeable cement mortar composed of aggregates, hydraulic binders, additives, and elastomeric polymers, which can also act as a base for subsequent flooring, for example with tiled bonded by an appropriate binder.

However, such coverings have some drawbacks; mainly, the fact that in order to finish the flooring it is necessary to wait for the hardening process to complete, with evaporation of the free water contained in the impermeable layer; this process can form bubbles or cracks, especially in the warm season.

On the other hand, if the impermeable layer is covered immediately with the finishing layer, the impermeable layer does not harden correctly and becomes rigid and brittle, losing the elastoplasticity characteristics that ensure, over time, preservation of waterproofing qualities.

Various patents are also known which, however, have limitations with respect to the present solution; accordingly, mention is made of US-4,588,458, which discloses the use of a polymer-bitumen mix as a covering for a perforated membrane; GB-2,008,179, which discloses the use of an asphalt-saturated felt glued with cement and an upper finish with soft asphalt; US-3,135,069, which discloses the use of cold asphalt with a perforated membrane interposed; FR-2,517,726, which discloses the use of a felt made of polyester, polyethylene, polypropylene, polyvinyl fibers or the like with a bitumen film which is hot-spread on the upper and lower face; GB-2,193,153, which discloses the use of a bituminous sheet of polyester/polyamide fibers which is confined, in its lower part, by an aluminum sheet fixed on a polypropylene film; US-4,684,568, which discloses the use of a polypropylene resin film spread on a fiber felt; EP-0,209,712, which discloses the use of a non-woven fabric made of polypropylene, polyethylene, polyester impregnated with bitumen while hot; DE-4,322,747, which discloses the use of a microporous polyethylene membrane covered by a layer of polyester.

All these known solutions provide for the specific use of materials such as bitumen, asphalt, or polypropylene resin, which substantially entail the drawback of requiring prior drying and hardening before covering with a finishing layer.

These described solutions also provide for impermeabilization on wood or cement substrates, but not on other surfaces, such as for example ceramic coverings,

owing to the particular structural characteristics of the products.

A principal aim of the present invention is therefore to solve the described problems, eliminating the drawbacks of the mentioned prior art, by providing a method that allows to perform quick laying of a flat covering, for example for floorings.

Within the scope of this aim, an important object of the present invention is to provide a covering that can dry in an optimum manner and quickly.

Another object of the present invention is to provide a covering that is immediately walkable and has high-level compressive-stress resistance characteristics.

Another object of the present invention is to provide a covering that can be produced on site and at low costs.

This aim, these objects, and others which will become apparent hereinafter are achieved by a method for producing flat coverings, characterized in that it comprises the following steps:

- a) laying, on a previously prepared foundation, a first layer composed of a mix having elastoplastic characteristics;
- b) laying, on said first layer, a microscopically perforated membrane having low water-permeability and good water-vapor permeability characteristics; and
- c) laying, on said membrane, a second layer that is similar to said first layer.

Further characteristics and advantages of the invention will become apparent from the following detailed description of a particular embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a perspective view of a flat covering;
figure 2 is a sectional view of the covering of figure 1.

With reference to the above figures, the reference numeral 1 designates a flat covering for a previously prepared foundation 2 that is constituted by a base provided for example by means of a concrete casting.

The flat covering 1 is produced on site and entails the execution of a first step, during which a first layer of mix 3, having elastoplastic characteristics and providing adhesion to any foundation 2, is laid on the foundation 2.

The first layer of mix 3 is composed of aggregates, hydraulic binders, additives, polymers and water, which, in order to achieve the elastoplastic characteristics, need to produce, after laying, the optimum evaporation of the water contained therein.

The first layer of mix 3 thus comprises a cement mortar composed of a mix of water-hardening binders with inert materials with the addition of at least one polymer, such as a polyacrylic resin, and water, all this being provided while cold.

Directly after the laying of said first layer of mix 3, a microscopically perforated membrane 4 is laid having low water-permeability characteristics and good vapor-permeability characteristics.

The membrane 4 is constituted by polypropylene or other similar material and is densely perforated with perforations the diameter whereof is preferably smaller than 200 microns.

The membrane 4 is transparent with respect to the first layer of mix 3; by means of the fine perforation, the water contained in the first layer of mix 3 can in fact evaporate, thus allowing optimum hardening; however, the membrane 4 at the same time allows immediate walking.

The particular structural configuration of the covering allows, as soon as laying has been performed, to superimpose immediately thereafter a finishing layer such as, for example, a ceramic covering.

The method for obtaining the covering 1 then entails the laying of a second layer of mix 5 constituted like the first layer of mix 3.

Advantageously, the second layer of mix 5 can act as an adhesive for the finishing materials, such as for example ceramic coverings.

It has thus been observed that said covering has achieved the intended aim and objects, a method having been provided that allows to produce flat coverings by quick laying and at low costs; the membrane superimposed on the first layer of mix allows optimum transpiration; it in fact allows water evaporation and avoids, during the warm season, the formation of bubbles; this allows the first layer to dry in an optimum manner and in a short time; moreover, the membrane protects the impermeable layer and allows it to withstand considerable temperature ranges without damage.

It should be noted that the membrane becomes walkable as soon as laying has been completed.

The interposition of the membrane between the two layers of mix allows to increase the tensile-strength characteristics of the covering.

The dimensions constituting the individual components of the product obtained with the method can of course be the most appropriate according to the specific requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A method for producing flat coverings, characterized in that it comprises the steps of:

a) laying, on a previously prepared foundation, a first layer composed of a mix having elasto-

plastic characteristics;

b) laying, on said first layer, a microscopically perforated membrane having low water-permeability and good water-vapor permeability characteristics; and

c) laying, on said membrane, a second layer that is similar to said first layer.

2. A method according to claim 1, characterized in that said membrane is constituted by finely cross-linked polypropylene with gaps having a diameter of less than 200 microns.

3. A method according to claims 1 and 2, characterized in that said first and second layers have characteristics providing adhesion to any surface and are composed of aggregates, hydraulic binders, additives, at least one polymer, and water.

4. A method according to claims 1 and 3, characterized in that said microscopically perforated membrane is laid directly after laying said first layer of mix, said membrane being permeable so as to allow the evaporation of water contained in said first layer.

5. A method according to claims 1 and 4, characterized in that said second layer of mix acts as an adhesive for finishing materials.

6. A covering characterized in that it comprises a first and a second layers composed of a cement mix having elastoplastic characteristics, a microscopically perforated membrane being interposed between said first and second layers.

7. A covering according to claim 6, characterized in that said first and second layers are composed of a mix having elastoplastic characteristics once it has hardened, said mix being constituted by a cement mortar composed of a mix of water-hardening binders with inert materials, at least one polymer, and water.

8. A covering according to claims 3 and 7, characterized in that said polymer is constituted by polyacrylic resin.

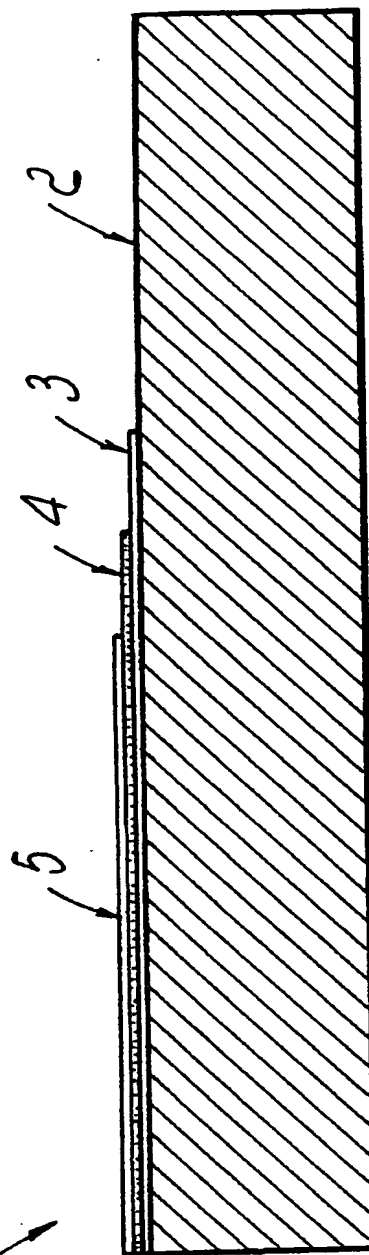
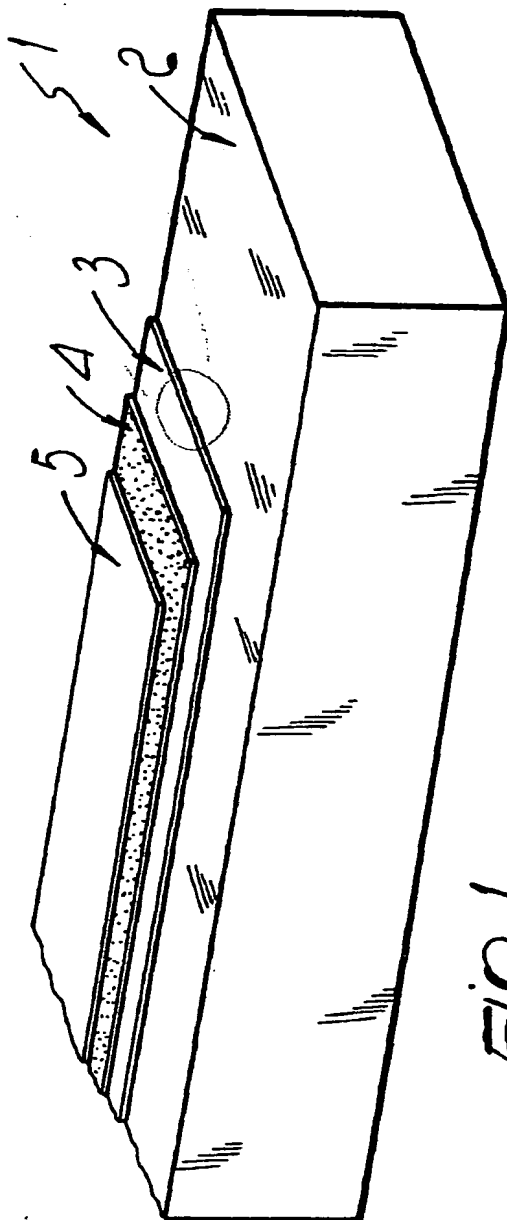
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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 10 3247

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A,D	US 4 588 458 A (PREVISANI) * column 2, line 46 - column 3, line 50; figures *	1-3,5-8	E04D11/02
A,D	GB 2 008 179 A (TAMIS LTD ET AL.) * page 1, line 10 - page 2, line 23 *	1,3,4, 6-8	
A,D	US 3 135 069 A (SCHULLER ET AL.) * column 2, line 28 - line 45; figures *	1,3,5-8	
A,D	EP 0 209 712 A (BAUDER GMBH) * page 1, paragraph 1 - paragraph 2 * * page 3, paragraph 2 - paragraph 3 * * page 6, last paragraph - page 7, paragraph 1 *	1-3,6-8	
A,D	GB 2 193 153 A (B.P.B. IND.) * page 1, line 32 - line 124; figures *	1,2,4-8	
A,D	FR 2 517 726 A (SIPLAST S.A.) * the whole document *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A,D	US 4 684 568 A (LOU) * column 1, line 44 - column 2, line 31; figures *	1,2	E04D
A,D	DE 43 22 747 A (PLOUCQUET GMBH) * column 1, line 36 - column 2, line 31; figures *	1	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 20 June 1997	Examiner Righetti, R
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention e : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure F : intermediate document			

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